

The Investment Allocation of Sovereign Wealth Funds

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Abstract: Sovereign wealth funds have emerged as an important investor of global equity, attracting growing attention. Despite frequently voiced concerns that sovereign wealth funds serve political objectives, little is known about their investment allocation. We collect new data on close to 30,000 equity investments by sovereign wealth funds and using both a country-level and firm-level analysis find that they tend to invest in countries with common cultural traits. This cultural bias indicates that sovereign wealth funds prefer to invest in the familiar. While other global investors show similar aptitude to investing in the familiar, the cultural bias of sovereign wealth fund investment is particularly pronounced.

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1. Introduction

Sovereign wealth funds (SWFs) are a large and growing component of global equity markets.

These government-owned investment funds currently hold about US\$3 trillion of equity, and the IMF (2000) predicts SWF equity holdings will rise to US\$10 trillion over the next decade.

Some have expressed concerns about SWFs (Summers, 2007; Gieve, 2008). One concern is that SWFs target militarily and technologically strategic industries.¹ A second concern is that large SWFs give their governments direct influence over global markets (Johnson, 2007).² Third, during the ongoing financial crisis, SWFs have emerged as investors with deep pockets, and have acquired strategic stakes in major banks and firms³, raising concerns that SWFs will adversely alter corporate strategies. These concerns have prompted calls for greater transparency of SWF holdings and strategies (Truman, 2007) and for the suspension of voting rights by SWFs to mitigate concerns that SWFs will distort the corporate strategies of domestic firms to satisfy the objectives of foreign governments (Milhaupt, 2008). Yet, little is actually known about the investments of SWFs.

Given these concerns, an emerging literature examines the stock price effects of SWFs. For example, Bortolotti et al. (2008) collect data on about 1,200 SWF investments and find that these investments tend to exhibit positive abnormal returns upon announcement but significantly negative long-term abnormal returns. A number of other papers have since confirmed these

¹ In 2005, for example, a United Arab Emirates-owned company, Dubai Ports World, stirred controversy in the US by purchasing P&O, a British-owned shipping company, giving it control over parts of several US port facilities. A year after the acquisition, the company was forced to divest the US operations out of national security concerns.

² In response to these concerns, multilateral organizations have developed best principles and practices for SWFs (see IMF 2008, OECD 2008, and International Working Group of Sovereign Wealth Funds, 2008).

³ Including luxury carmaker Daimler and global banking groups Citigroup and UBS. The Government of Singapore Investment Corporation alone invested a total of US\$16.5 billion in these two banks after they sought additional capital due to their massive losses on US subprime mortgages and investments in mortgage-backed securities.

findings.⁴ Kotter and Lel (2008) use data on 163 SWF investments and find that these investments exhibit positive abnormal returns. They also show that the degree of transparency of the fund is negatively associated with the size of these abnormal returns. Dewenter et al. (2009) and Fernandes (2009) also find that firm value increases when SWFs acquire equity stakes. Bernstein et al. (2009), instead, focus on private equity investments of SWFs, and find that they tend to invest when equity prices are relatively high.

Rather than focusing on stock price returns, we examine the asset allocation of SWFs and provide the first evaluation of whether SWF investment allocations are more biased by cultural and geographical familiarity than other global and institutional investors.. We construct a new, large dataset on public equity investments of SWFs that includes information on 29,295 foreign equity investments by SWFs over the period 1997-2007. We use these data to identify the investment biases of SWFs and compare these investment strategies with those of the overall market and other global investors.

This paper builds on the literature on international portfolio allocation, including research on the home bias of investment and the determinants of foreign asset allocation (e.g., Falkenstein, 1996; Kang and Stulz, 1997; Grinblatt and Keloharju, 2000; Dahlquist and Robertsson, 2001; Froot et al., 2001; Edison and Warnock, 2004; and Gelos and Wei, 2005). Over the past decades, most countries have lifted investment restrictions, which has fostered trading in assets abroad.⁵ Despite potential benefits from international portfolio diversification⁶,

⁴ These papers build on the more general literature on the investment strategies and performance of institutional investors (see, e.g., Karpoff et al., 1996, Carleton et al., 1998, Del Guercio and Hawkins, 1999, Chen et al., 2007, Giannetti and Laeven, 2008, and Ferreira and Matos, 2008).

⁵ Investment restrictions impose a tax on foreign investments (see Black, 1974, and Stulz, 1981). Several governments have recently encouraged SWFs to diversify internationally, lifting restrictions on foreign equity investments. The move from domestic to foreign equity, together with an increase in assets under management on the back of rising commodity prices, are key drivers of the increased importance of SWFs in global equity markets.

investors typically still invest a large fraction of their wealth in domestic assets. This home bias of financial assets has been well documented in the literature, and is generally ascribed to informational advantages.⁷ Similarly, investors often prefer to invest in familiar investment opportunities as opposed to foreign or unfamiliar investments (Huberman, 2001; Grinblatt and Keloharju, 2001). Such investments into the familiar could entirely be driven by informational advantages, or simply be an expression of affinity with the familiar (Guiso et al. 2007; Grinblatt and Keloharju, 2001).

Geographical and cultural factors, capturing differences in information, trust, or affinity with the familiar, have been found to affect economic outcomes, including the allocation of investment.⁸ For example, Guiso, Sapienza, and Zingales (2007) show that historical and cultural variables, particularly religion, affect trust in people from other countries, and that these differences in trust affect people's financial decisions, including portfolio and foreign direct investment. Similarly, investors often prefer to invest in familiar investment opportunities as opposed to foreign or unfamiliar investments (Huberman, 2001; Grinblatt and Keloharju, 2001). Such investments into the familiar could entirely be driven by informational advantages, or simply be an expression of affinity with the familiar. Grinblatt and Keloharju (2001) using data on shareholdings of institutional investors in Finland show that cultural affinity breeds investment and that such cultural biases are more pronounced for government-owned institutions

⁶ See, e.g., French and Poterba (1991) and Obstfeld (1994). Others argue that the gains from international diversification can largely be achieved indirectly at home through investments in stocks of multinational firms (Rowland and Tesar, 2004) or country funds and depositary receipts (Errunza et al., 1999).

⁷ See, for instance, French and Poterba (1991), Lewis (1996), and Baxter and Jermann (1997). Coval and Moskowitz (1999, 2001) show local investors tend to invest mostly in companies that are located nearby.

⁸ Country traits such as culture and physical distance have been found to determine not only global asset allocation. For example, Portes and Rey (2005) find that global equity flows are in large part determined by geographical distance, a proxy for informational asymmetry, while Stulz and Williamson (2003) find that religion explains differences in investor protection, a key determinant of foreign investment, better than other country factors. Hilary and Hui (2009) further show that religion also affects firm's investment behavior.

than for private institutions. Their argument is that government-owned institutions are less sophisticated investors that are more likely to invest in firms or countries they are acquainted with. In other words, investing in the familiar is an outcome of less sophistication.

An alternative explanation is that government-owned institutions are more prone to government influence, which is ultimately shaped by culture. Such influence could manifest itself in a number of ways, including directed investments or the imposition of investment restrictions. A large literature on the role of government has argued that cultural traits shape both the scope and the consequences of government intervention (see, e.g., Weber, 1958). For example, Guiso et al. (2006) show that different religious affiliations are associated with different preferences for redistribution by the government and affect actual redistribution in U.S. states, and La Porta et al. (1999) show that religious composition explains variation in government interference and influence. To the extent that culture plays a particularly important role in government decisions and the functioning of public sector institutions, this offers another rationale for why government-owned institutions may be more culturally biased than private institutions. There exists indeed much evidence of governments influencing the allocation of capital to serve political rather than social objectives (see, e.g., Megginson et al., 1994, and La Porta et al., 2002). For example, Sapienza (2004) finds that Italian state-owned banks pursue political objectives in their lending policies.

Whether familiarity of investment by government-owned institutions is an expression of less sophistication or direct government interference, either way the empirical prediction is that the investment of government-owned institutions is particularly prone to cultural bias.

Combining the insights from these strands of literature leads to two testable hypotheses. First, cultural differences influence the investment allocation of SWFs in a sense that countries

with a common cultural heritage attract more investment. The rationale is that familiarity as captured by common cultural heritage breeds investment. Second, this cultural bias should be particularly pronounced for government-owned SWFs, compared to privately-owned funds.

Our main findings are as follows. We find that SWFs tend to invest in countries that share similar cultural traits, specifically religion, suggesting that SWFs bias their investments to the familiar. Such preference for investing in the familiar may indicate the exploitation of informational advantages, or simply a tendency to feel affinity with the familiar. Moreover, we find that this cultural bias is more pronounced for SWFs than for other global and institutional investors. This cultural bias disappears with repeated investments in the same country, suggesting that informational asymmetries disappear over time as investors become more acquainted with local culture. In addition, we find that SWFs display significant industry biases, in particular that they hold a disproportionately large fraction of their stocks in oil companies. SWFs also tend to invest more in large-cap stocks, consistent with prior evidence on investments by institutional investors (Kang and Stulz, 1997, and Coval and Moskowitz, 1999).

While we do not explicitly investigate the key concerns regarding SWFs mentioned earlier, our findings start to build a bridge toward these concerns. For example, our finding that SWFs tend to invest disproportionately in oil companies is consistent with the concern that SWFs target technologically strategic industries. More generally, our finding that SWFs allocate their investments differently from non-government owned funds suggests that governments directly influence the global allocation of SWFs and is consistent with the concern that SWFs give their governments direct influence over global markets. This also raises another concern that such government-directed allocation is inefficient, with adverse implications for the future wealth of the citizens on behalf of which these funds invest.

The paper proceeds as follows. Section 2 presents a theoretical framework and empirical strategy for our analysis of the investment allocation of SWFs. Section 3 introduces our newly collected dataset on equity investments of SWFs and provides descriptive statistics. Section 4 presents our empirical analysis of the geographic allocation of SWFs' equity portfolios and its determinants. Section 5 concludes.

2. Methodology

Chan, Covrig, and Ng (2005), in their version of the Cooper and Kaplanis (1986) model, present a theoretical framework that is excellent for our analysis of foreign biases in the investment allocation of SWFs. Assume that a representative investor in country i maximizes the expected return of his portfolio investments for a given level of variance:

$$\max(w_i'R - w_i'c_i), \quad (1)$$

subject to

$$w_i'Vw_i = \sigma^2 \quad (2)$$

$$w_i'I = 1, \quad (3)$$

where w_i is a column vector containing portfolio weights, with w_{ij} the proportion of individual i 's total wealth invested in risky securities of country j , R is a column vector of pre-tax expected returns, c_i is a column vector of deadweight costs, with c_{ij} the deadweight cost to investor i of investing in country j , V is the variance-covariance matrix of gross returns of the risky securities, σ^2 is the given constant variance, and I is a unity column vector.

Setting the derivative of the Lagrangean of the above maximization problem with respect to w_i to zero, it follows that the optimal portfolio for investor i is:

$$w_i = (V^{-1} / \rho)(R - c_i - \lambda_i I) \quad (4)$$

where

$$\lambda_i = [I'V^{-1}(R - c_i) - \rho] / I'V^{-1}I$$

and ρ and λ_i are the Lagrange multipliers on equations (2) and (3), respectively.

Aggregating the individual portfolio holdings gives the market clearing condition for the world capital market equilibrium:

$$\sum \pi_i w_i = w^*, \quad (5)$$

where π_i is the proportion of world wealth owned by country i , w^* is a column vector of world market capitalization shares, with w_i^* country i 's share in world market capitalization. Defining z as the global minimum-variance portfolio, $z = V^{-1}I / (I'V^{-1}I)$, and combining equations (4) and (5), we obtain:

$$\rho V(w_i - w^*) = (\sum \pi_i c_i - c_i) - z'(\sum \pi_i c_i - c_i)I \quad (6)$$

With non-zero deadweight costs, the portfolio holdings of each investor will deviate from the world market portfolio. To examine the deviation, consider the simple case where V is a diagonal matrix with all variances equal to a constant v . In this case, the portfolio weight of investor i in country j will deviate from the world market portfolio according to:

$$\rho v(w_{ij} - w_j^*) = -c_{ij} + \sum \pi_k c_{kj} + z'c_i - z'\sum \pi_i c_i, \quad i \neq j \quad (7)$$

where $z'c_i$ can be interpreted as the weighted average marginal deadweight cost for investor i , $\sum \pi_k c_{kj}$ as the weighted average marginal deadweight cost for investors investing in country j , and $z'\sum \pi_i c_i$ as the world-weighted average marginal deadweight cost.

It follows that the share invested by investor i in country j is affected by the difference between the deadweight cost for investor i investing in country j , c_{ij} , and the weighted average deadweight cost for world investors investing in country j , $\Sigma \pi_k c_{kj}$. If c_{ij} is significantly larger than $\Sigma \pi_k c_{kj}$, investor i underweights country j . Alternatively, if c_{ij} is significantly smaller than $\Sigma \pi_k c_{kj}$, investor i exhibits a positive foreign bias to investing in country j and overweighs country j 's securities.

Equation (7) can empirically be estimated as follows:

$$f_{ij} = \alpha_i + \alpha_j + x_{ij}' \beta + \varepsilon_{ij}, \quad (8)$$

where $f_{ij} = (w_{ij} - w_j^*)$, $\alpha_i = (z'c_i - z'\Sigma \pi_i c_i) / \rho v$, $\alpha_j = \Sigma \pi_k c_{kj} / \rho v$, $x_{ij}' \beta = -c_{ij} / \rho v$, and ε_{ij} is an error term, with x_{ij} a vector of explanatory variables that determine the overall deadweight cost (or benefit) to investor i of investing in country j . In the literature, such explanatory variables traditionally relate to transaction costs or taxes (e.g., Black, 1974; Cooper and Kaplanis, 1986). More recently, variables related to institutional development, investor protection, and familiarity have also been considered (e.g., Chan et al., 2005). While traditional variables such as taxes and transaction costs present deadweight costs to investors, resulting in a negative foreign bias, informational advantages arising from similarity in institutions or culture across countries could actually present a net benefit to investors of investing in a particular country. Familiarity arising from common language or religion is a case in point (e.g., Grinblatt and Keloharju, 2001).

Unlike most existing literature on the home and foreign biases of investors, we conduct our analysis both at the country and firm level. To this end, we first estimate equation (8) using bilateral country-level regressions of the foreign bias of SWFs relative to each country's weight

in a benchmark portfolio, and second using firm-level regressions of the foreign bias of SWFs relative to each firm's weight in a benchmark portfolio.

To distinguish between whether investing in the familiar is an expression of informational advantages or simply a tendency to feel affinity with the familiar, we extend the analysis in two ways. First, we directly control for information, following Portes and Rey (2001), using information on the total volume of telephone calls between home and host country of investment. A significant coefficient on this information variable would suggest that informational asymmetries are at play. Second, we test whether any cultural biases disappear over time with repeated investments in the same country by including an interaction between variables capturing cultural bias and a variable denoting whether the fund has had repeated investments in the country. Under the assumption that informational asymmetries disappear over time as investors become more acquainted with local culture but biases that are simply an expression of feeling affinity with the familiar are more persistent over time, a significant coefficient on this interaction term suggests that informational asymmetries are at play.

As robustness checks, we use alternative proxies for cultural distance, and control for a host of other factors that may be correlated with cultural bias, such as common legal tradition or colonial heritage.

3. Data and Descriptive Statistics

3.1 Data

The heterogeneous group of SWFs include reserve management funds, stabilization funds, commodity savings and heritage funds, development funds, and pension reserve funds. We follow the criteria established by the International Working Group of Sovereign Wealth Funds

(2008), and define SWFs as special purpose investment funds or arrangements, owned by the general government, set up to meet a variety of macroeconomic and financial objectives, including investments in foreign financial assets.⁹ SWFs are commonly established out of balance of payments surpluses, official foreign currency operations, proceeds from privatizations, fiscal surpluses and/or receipts resulting from commodity exports.

We start with the list of SWFs that are members of the International Working Group of Sovereign Wealth Funds (2008). This list includes SWFs from a broad set of countries. For example, for Norway, this list includes the Government Pension Fund-Global (formerly the Government Petroleum Fund), which invests in foreign equity, but does not include the Government Pension Fund-Norway (formerly the National Insurance Scheme Fund), which invests solely in Norwegian companies.¹⁰

While the typical investment strategy of these SWFs is to invest in a global, diversified portfolio to maximize long-term returns subject to an acceptable risk level, some are subject to additional investment objectives that may affect their allocation and returns. For example, the Norwegian SWF is subject to a set of ethical guidelines that prevent the fund from investing in the arms industry and in companies with activities that harm the environment.

We then collect data on equity investments for each SWF, including the timing and size of the investment, using annual investment reports when available from each fund's public

⁹ This definition excludes, inter alia, foreign currency reserve assets held by monetary authorities for traditional balance of payments or monetary policy purposes, operations of state-owned enterprises, and traditional government-employee pension funds.

¹⁰ The list also does not include the investment tranches of Saudi Arabia's central bank, because these are mainly foreign currency reserve assets held by the country's monetary authority, nor does it include Malaysia's government-owned enterprise, Khazanah Nasional, which has a large proportion of short-term oriented equity investments and invests largely in the South-East Asian region.

website.¹¹ We further augment this data by searching SWF-specific websites for information, including the website from the SWF Institute (www.swfinstitute.org). One limitation is that many SWFs only disclose a partial list of their investments. Since we are concerned that incomplete coverage would bias our empirical results, we limit our sample to SWFs with complete information on their public equity portfolio holdings. This reduces the sample to investments from four SWFs: Government Pension Fund of Norway, National Pensions Reserve Fund of Ireland, Alaska Permanent Fund, and New Zealand Superannuation Fund.¹² Our total sample, measured at end-2007, consists of 10,282 global equity investments from these four SWFs. Our empirical model is specified in terms of bilateral differences in culture and other factors between the home and host countries of SWF investments, and the empirical identification is thus based on a much larger number of observations than the number of SWFs included in the sample.

SWFs are a diverse group of investors. The SWFs included in our sample fall in the category of pension reserve funds that are set up to manage national assets for social security benefits, taking a long-term investment perspective. These funds invest in a globally diversified portfolio, unlike other SWFs that behave more like strategic investors, taking large stakes in a relatively small number of companies, much like private equity funds do.¹³ Not surprisingly,

¹¹ We obtain information on each investment from the following websites: www.regjeringen.no, www.apfc.org, www.nprf.ie, and www.nzsuperfund.co.nz. The complete dataset is available upon request from the authors.

¹² We did collect information on other SWFs (including the Abu Dhabi Investment Authority, China Investment Corporation, Government of Singapore Investment Corp, Korea Investment Corporation, Kuwait Investment Authority, Qatar Investment Authority, and Temasek Holdings) using a variety of sources (including 13G and 10K filings and company websites) but exclude investments by these funds because of incomplete coverage. Our results are, however, qualitatively similar when including investments from these SWFs in the analysis.

¹³ To the extent that data is disclosed, it appears that most Middle Eastern and Asian funds fall into the latter category. For example, publicly available data on the investment holdings (obtained from their websites) of two Middle Eastern SWFs (Mubadala of Abu Dhabi and Mumtalakat of Bahrain) and two South East Asian SWFs (Khazanah of Malaysia and Temasek of Singapore) indicate that each of these SWFs invest in a small number of mostly unlisted companies (ranging from 32 to 55) in a small number of countries (ranging from only 3 to 10

(continued)

giving the public availability of data on their investments, the funds in our sample are ranked highest among SWFs in terms of quality of transparency and governance according to Truman (2008).¹⁴ Most other funds are much less transparent about their investment holdings.¹⁵ Moreover, the funds in our sample are from advanced economies where state interference in the allocation of assets is likely to be less pronounced than in some other countries with SWFs where state control is a dominant feature of the economy. The fact that the funds in our sample score the highest in terms of governance and transparency, invest in globally diversified portfolios, and operate in advanced economies is likely to bias our results against finding strong biases in the investment allocation of these funds, and suggests that investment biases of other SWFs not included in our sample, are likely to be more pronounced than the results presented here.

For each investment we collect information on the date of investment, the amount invested, and the percentage of equity acquired. We collect information on a total of 29,295 equity holdings by SWFs over the period 1998-2007, comprising of 10,282 equity holdings across 51 countries at year-end 2007. This includes investments in both private and public equity. For each of the firms that receive these SWF equity investments, we collect year-end market capitalization from Datastream International and firm-level accounting data from Worldscope. We have firm-level market capitalization and accounting data for a total of 5,564 SWF equity investments as of end of 2007.

countries), with the majority of investments in the region, resulting in strong home and regional biases. While coverage of this data varies, Temasek reported total assets under management of US\$ 134 billion and disclosed 32 equity investments, totaling US\$112.8 billion, or 84.2% of the total.

¹⁴ The transparency score ranges from 0 to 12 and is based on three broad categories, including the degree of public disclosure of financial reports, the degree of public disclosure of investments, and the extent of public audits. The governance score ranges from 0 to 4 and is based on a number of factors, including the role of the government in setting the investment strategy, the role of the manager in executing investment strategy, guidelines for corporate responsibility, and whether the fund has ethical guidelines for investments.

¹⁵ For example, Abu Dhabi Investment Authority and Qatar Investment Authority are ranked the lowest by Truman (2008), with a minimum score of zero for both governance and transparency.

For our bilateral investment analysis we require stock market capitalization of each of the invested countries in our sample. Such data is obtained from the World Bank's annual World Development Reports. As an alternative benchmark for the size of the host equity market, we use the Morgan Stanley Capital International (MSCI) indices obtained from MSCI Barra.

Two SWFs in our sample publish their holdings annually, namely the Government Pension Fund of Norway and the National Pension Reserve Fund of Ireland. For these two funds, we collect time-series information on their equity investments over the period 2002 to 2007 from their annual investment reports, resulting in a total of 17,075 investment-year observations. The annual investment reports only report the end-year investment holdings and we are therefore unable to identify the exact investment date for these investments.

We complement the data on the investment allocation of SWFs with data on the global asset allocation of three other groups of global investors: the universe of global investors, private institutional investors, and public institutional investors. Using this data we are able to compare the asset allocation of SWFs with that of other global investors. The global asset allocation of the universe of global investors, including individuals and institutional investors, is measured using data on the geographical distribution of all cross-border equity investments. As representative of the allocation of private institutional investors, we use the global asset allocation of US-domiciled global mutual funds. And as representative of public institutional investors that are not government-owned, unlike SWFs, we use CalPERS, the California Public Employees' Retirement System and one of the largest public pension funds in the world.¹⁶

¹⁶ CalPERS, though a public pension fund, is not a SWF. First, it is not directly controlled or owned by the state, being a government-sponsored fund with an independent board of directors. Second, it does not manage state-owned assets but rather contributions from state employees and employers. Third, fund beneficiaries are public workers and retirees, not the state of California.

It is particularly interesting to contrast the investment allocation of CalPERS with that of the SWFs in our sample for two reasons. First, CalPERS, though a public pension fund, is not directly controlled or owned by the state, unlike the SWFs in our sample. We therefore expect political interference in investment to be less pronounced in the case of CalPERS.¹⁷ Second, CalPERS and the SWFs in our sample are all based in advanced economies with similar level of economic and financial development, and any difference in their investment allocation is therefore unlikely due to differences in economic or financial development.

We obtain annual data on the geographic breakdown of cross-border equity investments from the Coordinated Portfolio Investment Survey (CPIS) maintained by the International Monetary Fund. The CPIS dataset provides a geographical breakdown of information on individual economy year-end cross-border holdings of portfolio investments in equity securities (valued at market prices), cross-classified by the country of issuer of the securities. These data proxy for the actual geographical distribution of cross-border investments in equity securities. The CPIS investments represent the universe of global equity investors, including individuals and institutional investors. The CPIS dataset provides a total of 5,655 country-pair-year observations over the period 2001 to 2007.

Next, we obtain data on the global portfolio holdings of individual US mutual funds from EPFR Global (www.epfr.com), a company that sells mutual fund asset allocation data to major financial institutions. We limit the sample of mutual funds to funds that have a mandate to invest globally to enhance comparability with SWFs. For each fund, we have detailed information on portfolio holdings, including the size of each investment and the country of investment, for the

¹⁷ Smith (1996) has found that shareholder activism on the part of CalPERS increases firm value.

period 1997-2007. We aggregate foreign shareholdings at the host country level for each fund into a total of 131 country-pair observations, covering a total of 87 global mutual funds.

Data on the equity investment allocation of CalPERS are obtained from their Annual Investment Reports, available from www.calpers.ca.gov. We have data on the complete portfolio holdings for the period 2002 to 2007, covering 46,582 investments. For our country-level regressions, we aggregate firm-level investments at the host country level into 297 country-level observations.

3.2 Descriptive statistics

Table 1 reports descriptive statistics on the largest 20 SWFs in the world, including their name, country of origin, asset size, year of inception, and size of the fund relative to the total foreign reserves of the country. We obtain this information from the SWF Institute. For the funds included in our sample, indicated by an asterisk, we also report the number of foreign equity investments at year-end 2007, obtained from the annual investment report of the fund.

The largest SWF is the Abu Dhabi Investment Authority (ADIA) fund with an estimated US\$875 billion in assets under management at end-2007. Other countries with SWFs in excess of US\$100 billion include Norway and Singapore. The Norwegian Government Pension Fund is with US\$132.8 billion in foreign equity at end-2007 the largest equity investor among SWFs.

Though some SWFs have been around for decades—the funds established by Abu Dhabi and Singapore date back to the 1970's—, the number and size of SWFs has been rising fast in recent years, spurred by record commodity prices and rapid accumulation of foreign reserves.

The largest SWFs, while still smaller than the largest private asset managers, are much larger than the largest private equity funds and hedge funds, and important global players (see

Appendix 1). According to estimates from the Economist, total assets under management of SWFs currently exceed those of both hedge funds and private equity funds.

Table 2 reports the geographic breakdown of the listed equity investments for the SWFs included in our sample. The geographic diversification of the equity portfolio is rather limited, with the Alaska fund exhibiting substantial home bias, and with all funds displaying a foreign bias toward investments in the US and UK, possibly because SWFs exhibit preference for large and liquid stock markets when investing abroad. Such preference may be related to weaker disclosure rules and lower compliance costs for investments in the UK compared to the US (see also Zingales, 2006, and Doidge et al., 2008).¹⁸ A comparison between the country allocation of our SWFs and that of global equity markets, reported in the last column of Table 2, indicates that SWFs tend to be overweight in advanced economies and underweight in other countries.

Table 3 reports the industry breakdown of equity investments in our sample. SWFs appear to predominantly invest in the financial sector. This bias is particularly strong for the New Zealand fund. The Alaska fund also holds a relatively large fraction of equity in technology stocks. Investments in consumer goods and utilities are fairly limited.

While the majority of SWFs' equity investments are in global listed equities, some SWF have substantial holdings of private equity notably some Middle Eastern funds), though such information is less well documented (see Bernstein et al., 2009, for a detailed study on private equity holdings of SWFs).¹⁹ According to their investment reports, the funds in our sample hold almost no private equity stakes. Our analysis therefore focuses on public equity investments.

¹⁸ Similar results have been found for firms choosing where to raise capital (e.g., Henderson et al., 2006).

¹⁹ Abu Dhabi Investment Authority and Qatar Investment Authority appear to be particularly active private equity investors, with substantial private equity stakes in well-known companies such as Ferrari and the Carlyle Group.

4. Investment Allocation of Sovereign Wealth Funds

In this section, we analyze the geographic allocation of SWFs' equity portfolios and its determinants. We conduct our analysis both at the country and the firm level.

4.1 Country-Level Analysis

We start by estimating equation (8) at the bilateral country-level to identify foreign biases in the investment allocation of SWFs, much like a gravity model from the trade literature. As explanatory variables for foreign biases in investment allocations we include several bilateral differences in country traits (between home and host country), including physical distance, cultural distance (in languages and religion), and differences in legal origin.

As dependent variable, we use the log difference between the share of country j in total equity investments by SWFs from country i and the share of country j in the world equity market, or $\ln(w_{ij} / w_j^*)$. Note that we specify the dependent variable in log difference terms, following Chan et al. (2005). We compute country j 's share in the world equity market as the overall share of country j equities in total world market capitalization (as reported by the World Bank's World Development Report), or as the weight of country j in the MSCI world equity index (both as of end-2007). The firm-level investment data is aggregated at the country level into bilateral country pairs between home and host country of investment and the total number of observations is therefore much less than the number of investments for which we have collected data. Variable $\ln(w_{ij} / w_j^*)$ denotes the foreign equity bias, and takes on a positive (negative) value if the fund's equity allocation to that particular country is overweight (underweight). For example, if the SWF of country i has 11% of its total equity investments invested in firms in country j , but country j has only a share of 10% in world stock market capitalization, then the foreign equity bias for this particular country pair, $\ln(w_{ij} / w_j^*)$, is 10%. The sample consists of

investments in publicly listed and traded equities only. We exclude domestic investments from the sample in all regressions to focus on the foreign equity bias of each fund, and rescale the portfolio weight of each foreign investment such that the weights sum to 100 percent. However, including domestic investments does not alter any of this paper's findings.

As explanatory variables we include a number of bilateral differences in country characteristics. Prior research has found that investors prefer to invest in familiar investment opportunities as opposed to foreign or unfamiliar investments (Huberman, 2001; Grinblatt and Keloharju, 2001). Such familiarity of investment can be due to informational advantages or simply affinity with the familiar. We capture such preferences using a set of geographic and cultural distance variables.

First, we control for the distance between the capital cities of the home and host country, where home country denotes the country of origin of the SWF and host country denotes the country where the investment takes place. Rey and Portes (2005) have argued that physical distance proxies for informational asymmetries. The distance data come from Gleditsch and Ward (2001). We take the inverse of the distance in kilometers and consider this a measure of geographical closeness. In other words, our measure of geographic closeness denotes the inverse distance (closeness) between home country i of a given SWF and host country j of investment.

In terms of cultural variables, we have data on languages and religion in the year 1980 from Acemoglu et al. (2008).²⁰ All cultural variables are arranged such that they indicate similarity between two countries, with higher scores denoting more similarity or proximity. Let $l \in \{1, \dots, L\}$ denote the total number of distinct languages (or religions) in the sample. Let

²⁰ We also have data on ethnicity but do not use this information because there is little overlap in ethnic groups between the home and host country of investment for the SWFs in our sample. However, controlling for bilateral differences in ethnicity does not alter this paper's main findings.

$S_i = (S_{i1}, \dots, S_{iL})$ be the vector of shares of language groups in home country i .

Following Acemoglu et al. (2008), we then define closeness of home country i and host country j

in terms of languages (or religion) as the uncentered correlation $\frac{\sum_l S_{il} S_{jl}}{\sqrt{(\sum_l S_{il}^2)(\sum_l S_{jl}^2)}}$. We follow

the same approach for religion.

To make sure that our measures of cultural bias are not capturing differences in legal tradition, we also control for common legal origin between countries. A large literature starting with La Porta et al. (1998) has shown that legal tradition is an important determinant of financial and economic outcomes, including financial development. Data on legal origin of the country are from the 2001 CIA World Factbook which distinguishes between five different legal traditions: English, French, German, Nordic, and Socialist. We create a dummy variable Legal Origin Closeness that takes on a value of one if home and host country of investment share the same legal origin, and zero otherwise. Summary statistics on the main regression variables are reported in Appendix 2.

The results of the bilateral investment regressions are in Table 4. The first set of regressions report results using alternative proxies for the weight of each country in a benchmark world portfolio, either based on the country distribution of world stock market capitalization or the country weight in the MSCI World Equity Index, both measured at year-end 2007. We correct standard errors for clustering at the fund's home country level. We do not include host country fixed effects in these regressions because otherwise the country-specific benchmark portfolio weight that is a part of the foreign bias variable would drop from the estimation. However, including host country fixed effects does not alter our main findings.

Column (1) presents regression results with foreign bias relative to the share of each country in world stock market capitalization as dependent variable. By aggregating the more than 10,282 year-end 2007 investments at the bilateral country level, the sample reduces to 150 observations. On average, the funds have investments in about 37 countries. We find that SWFs tend to be overweight in countries with the same religious origin. The economic effect of this result is significant. For example, a one standard deviation increase in Religious Closeness (0.38) would imply an increase in foreign bias of 0.78. This is significant given the standard deviation of foreign bias of 1.69.

In Column (2), we use the MSCI World Equity index as an alternative proxy for the world market portfolio, and confirm the results on Religious Closeness.

The natural question to ask is whether these biases are more pronounced for SWFs than for other global investors. To answer this question, we re-estimate the model with the difference in foreign bias of SWFs and other investors as dependent variable. Because the foreign biases of SWFs and other investors are both expressed relative to the market portfolio, the market weight drops out when computing the difference in foreign bias between the two groups of investors, and the dependent variable can thus be restated as the difference between the foreign investment allocation of the SWF and the global investor. We use three alternative benchmarks for the portfolio allocation of global investors, all measured at year-end 2007: the allocation of CPIS investors, representing the universe of global investors; the allocation of US-domiciled global mutual funds, representing private institutional investors; and the portfolio allocation of the CalPERS fund, representing the allocation of public institutional investors. Data are aggregated at the host country level.

Column (3) reports results for the foreign bias of SWFs relative to CPIS investors. CPIS data are aggregated by host country, so that the dependent variable captures the allocation bias of a given SWF to a particular country with respect to the allocation to that country of all CPIS investors. As before, we do not include host country fixed effects because the CPIS variable is a host-country level variable. Given missing CPIS data on a number of countries, the sample reduces from 150 to 139 observations. We find that the foreign bias of SWFs compared to the average CPIS investor is primarily influenced by religious affinity. A one standard deviation increase in Religious Closeness (0.38) implies an increase in foreign bias relative to CPIS investors of 0.51. This is large compared to its sample standard deviation of 1.66, though smaller than the estimated effect of Religious Closeness in Column (1). These results indicate that the influence of religious affinity on global asset allocation is more pronounced for SWFs than for the average CPIS investor.

Column (4) reports results for the bias of SWFs with respect to the country-level allocation of US-domiciled mutual funds using 2007 data on their global shareholdings. Given that US mutual funds invest in a smaller set of countries than our SWFs, the sample reduces from 150 to 131 observations.

Column (5) reports results for the bias of SWFs with respect to the country-level allocation of CalPERS, one of the largest public pension funds in the world, using data on all its individual portfolio holdings at year-end 2007. The sample reduces to 136 observations.

We obtain similar results on the relative importance of religious affinity in explaining the global asset allocation of SWFs. A one standard deviation increase in Religious Closeness (0.38) implies an increase in foreign bias relative to US mutual funds of 0.45 and an increase in foreign bias relative to CalPERS investments of 0.30. These effects are large compared to the sample

standard deviation of foreign bias relative to US mutual funds of 1.39 and the sample standard deviation of foreign bias relative to CalPERS investments of 1.37.

Column (6) reports results when we include host country fixed effects into the regression reported in Column (1) to account for systemic differences across host countries that could influence foreign bias, such as capital controls or preference for dollar investments. This does not alter our results.

These results are not confounded by high correlation between the different Closeness variables. As shown in Panel B of Appendix 2, the correlations between the different Closeness variables, with the exception of the correlation between Language Closeness and Legal Closeness, is generally low. We obtain qualitatively similar results when we include individual Closeness variables one-at-a-time.²¹

4.2 Firm-Level Analysis

Next, we estimate equation (8) using a measure of foreign bias that is constructed at the firm-level for each fund using comprehensive data on individual equity investments. Specifically, the dependent variable, firm-level foreign bias, is defined as the difference between a firm's share in total equity investment of the fund and that firm's share in the world market capitalization at year-end 2007. Following Coval and Moskowitz (1999), we do not specify the foreign bias in terms of log differences, unlike we do in the country-level regressions. However, using log differences does not alter our main findings. Given the relatively small size of each investment, the foreign bias variable is expressed in per milles (i.e., in tenths of percentages).

We use the same set of Closeness variables as in Table 4. As firm-level control variables, we include the natural logarithm of the firm's stock market capitalization, to proxy for firm size,

²¹ As a robustness check, we run quantile regressions for the regression specifications in Table 4 and obtain very similar results (not reported), indicating that the results are not driven by outliers.

the leverage ratio, measured as the ratio of debt to assets, to proxy for firm indebtedness, the current ratio, the pre-tax return on assets, and the market-to book ratio. These variables have been also been used in previous literature (e.g., Kang and Stulz, 1997, and Coval and Moskowitz, 1999). We obtain firm-level data from Compustat and Worldscope for the year 2007. Due to missing accounting and equity price data on about 10% of firms, the sample reduces to 5,564 equity investments. We include industry fixed effects to control for unobserved industry characteristics. We obtain similar results on religious affinity, and also find that trade closeness and language affinity are associated with foreign bias. In addition, we find that foreign bias is less pronounced for investments in larger firms. In sum, we find that cultural ties and affinity, either through religion, language, or trade, influence foreign investments of SWFs.

We include home and host country fixed effects to control for unobserved time-invariant home and host country characteristics, such as fund specific biases or strategies, country specific capital controls, and general preference for dollar investments. In addition, we include industry fixed effects to control for unobserved time-invariant industry characteristics that may influence firm-level equity investments. We correct for two-way clustering at the home and host country level to mitigate concerns that standard errors are inflated because of repeated home-host country pair observations of the Closeness variables. The results are presented in Column (1) of Table 5.

We confirm our earlier findings that religious affinity is a key determinant of the foreign bias of SWFs. We now also find that Physical Closeness enters with a positive and significant coefficient, suggesting that SWFs tend to prefer investments that are located close to home, though the effect is significant only at the 10 percent level. The effect of Religious Closeness is also economically significant. A one standard deviation increase in Religious Closeness implies an increase in foreign bias of 0.17, which is significant given its standard deviation of 1.49.

In terms of firm-level variables we find that foreign bias is more pronounced for firms with high stock market capitalization and less pronounced for firms with high market-to-book ratio, although the latter effect is significant only at the 10 percent level, suggesting that SWFs tend to invest in large-cap and value stocks. These results are consistent with previous results in the literature. For example, Coval and Moskowitz (1999) also find that investors have a strong preference for firms with high stock market capitalization and low market-to-book ratio, while both Kang and Stulz (1997) and Ferreira and Matos (2008) find that foreign investors have a strong preference for the stock of large firms. The effect of firm size as measured by market capitalization is economically significant. A one standard deviation increase in the logarithm of market capitalization implies an increase in foreign bias of 0.51, which is significant given its standard deviation of 1.49.

In column (2), the dependent variable is foreign bias relative to CalPERS, defined as the difference between the share of firm j in total equity investment of the fund and the share of firm j in total equity investment of CalPERS at year-end 2007. We again find that the foreign bias of SWFs is primarily influenced by religious affinity, even when compared to the allocation of a representative public pension fund such as CalPERS, suggesting that the cultural bias of SWFs is particularly pronounced. The effect of religion is also economically significant. A one standard deviation increase in Religious Closeness implies an increase in foreign bias relative to CalPERS of 0.23, which is significant given its standard deviation of 1.16.

Together with the results in Table 4, these results provide evidence in support of our two hypotheses that (i) the investment allocation of SWFs exhibits a cultural bias and (ii) this cultural bias is particularly pronounced for government-owned SWFs compared to privately-owned funds. Why would cultural biases be particularly pronounced for SWFs? State interference in the

investment allocation of government-owned SWFs could explain the difference, or, as argued by Grinblatt and Keloharju (2001), simply a lack of sophistication of government-owned funds.

Next, we include alternative proxies for cultural distance to assess whether religion is an important component of the cultural bias we identify or is merely proxying for other aspects of cultural differences that we have not controlled for thus far. In Column (3), we include a variable that captures differences in cultural dimensions as identified by Hofstede (1980). Specifically, Hofstede Value Closeness is the uncentered correlation between home and host country across four cultural dimensions: Power Distance, Individualism, Masculinity, and Uncertainty Avoidance.²² In Column (4), we include a variable that captures differences in cultural values as identified by the World Values Survey.²³ Specifically, World Survey Closeness is the uncentered correlation between home and host country across two cultural dimensions: Traditional/Secular-rational values and Survival/Self-expression values. The first dimension contrasts societies in which traditional values, including religion, are important, with societies in which secular-rational values are important. The second dimension contrasts societies in which survival values are important with more modern societies in which self-expression values are important. The World Values data are from Inglehart and Welzel (2005). We use data from the 2000 survey if available, and otherwise from the 1995 survey. We find that our main results on Religious Closeness are robust to the inclusion of these additional cultural variables, despite significant correlation between Religious Closeness and these additional cultural variables, especially the Hofstede Value variable (see Appendix 2, panel B).

²² We obtain the Hofstede cultural values data from http://www.geert-hofstede.com/hofstede_dimensions.php.

²³ The World Values Surveys are designed to measure all major areas of human concern, from religion to politics to economic and social life. It turns out the two summary dimensions considered here explain more than 70 percent of the cross-cultural variance on scores of more specific values.

We already control for a host of factors that could proxy for cultural bias, including physical distance and common legal tradition, and include home and host country fixed effects to control for unobserved home and host country characteristics. To further mitigate concerns about omitted factors, we include additional control variables that capture structural differences across countries. Specifically, in Column (5) we include a dummy variable, Colonial Heritage Closeness, that indicates whether or not the home and host country of investment share common colonial heritage. We construct this variable using data on colonial origin from the CIA Factbook. Our results on Religious Closeness are unaltered.

Investments into the familiar could entirely be driven by informational advantages, or simply be an expression of affinity with the familiar (Guiso et al. 2007; Grinblatt and Keloharju, 2001). To assess whether the cultural bias we have identified thus far simply captures informational advantages, we extend the analysis by including a measure of information asymmetries between countries. Following Portes and Rey (2001), we construct a variable, Telephone Traffic, that is the total volume of telephone calls (in millions of minutes) between the two countries, regardless of the origin of the call, normalized by dividing by the square root of the product of GDP (in billions of US dollars) of the two countries to remove size effects. Data on incoming and outgoing telephone traffic between countries are for the year 1997 and come from the Direction of Traffic database compiled by the International Telecommunication Union (ITU). For each country, ITU reports information on incoming and outgoing call volumes only for the 20 largest host countries in terms of total call volume. To enhance coverage for the US, we supplement the ITU data with data on call volumes from the Federal Communications Commission (FCC), the original ITU data source for US data, such that our dataset covers at least 90 percent of total call volumes for all home countries in our sample. Column (6) reports

the regression results when we include the Telephone Traffic variable. This information variable does not enter significantly, while the Religious Closeness variable maintains its statistical and economic significance, suggesting that Religious Closeness is not simply capturing informational asymmetries between countries.

In unreported regressions, we also control for whether or not the home and host country are major trading partners using data on trade flows between the two countries. Specifically, we measure Trade Closeness as trade (exports plus imports) between home and host country in year 2000 divided by total trade of the home country in year 2000. Data on bilateral trade flows are from Acemoglu et al. (2008). As countries trade in goods and services, they exchange information, and Trade Closeness can thus be regarded as an alternative proxy for information. Controlling for Trade Closeness does not alter our main findings, lending additional support to the premise that our culture variables are not simply capturing informational asymmetries between countries. We do not include the Trade Closeness variable in our main regressions because it is less exogenous than our cultural variables and because trade flows are likely to be driven by the same cultural variables as portfolio investment flows are.

Thus far, we have regressed foreign bias measured at year-end 2007 on cultural variables measured in 1980. Our regression strategy thus implicitly assumes that cultural traits are constant over time. As robustness check on the timing of the cultural variables, we repeat the analysis using data on religion and language composition in 2001 from Alesina et al. (2003). In addition to accounting for changes in religious composition over the period 1980 to 2001, this robustness check also accounts for potential differences arising from differences in the number of distinct religions between the two datasets. For example, Alesina et al. (2003) treat Shiite and Sunni Muslims as two distinct religious groups, unlike our 1980 dataset, and split Protestantism into a

number of subdenominations. The language groupings are the same in both datasets. The results are presented in Column (7). We find that Religious Closeness, now measured in 2001, remains an important factor in explaining the foreign bias of SWFs.

One frequently voiced concern is that SWFs may target militarily or technologically strategic industries, such as the energy sector. At the same time, several SWFs obtain their contributions from revenues in the oil and gas sector. Exposure to the energy sector could induce SWFs to diversify away into other industries, or to invest a disproportionate share into this sector because of familiarity considerations. In addition, some governments impose investment restrictions on SWFs, such as ethical guidelines, to direct resources to what they consider to be socially responsible investments. Thus far, such industry effects have been subsumed in industry fixed effects. In Table 6, we measure such industry biases directly.

In Column (1), we include a dummy variable denoted Unethical Industry that indicates whether or not the firm engages in mining activities that are potentially harmful to the environment or in the production of arms and ammunition.²⁴ This range of activities roughly coincides with the industries that the Norway SWF is restricted from investing in on ethical grounds. Pressure has grown on several other SWFs to adhere to such ethical guidelines. For example, the New Zealand SWF recently stated that it no longer invests in ethically compromised companies. We indeed find that SWFs underweight unethical industries.

In Column (2), we include a dummy variable denoted Oil Industry that indicates whether or not the firm engages in the production or extraction of oil and gas or related activities.

²⁴ Specifically, we include the following industries: metal mining (SIC 1021, 1031, 1041, 1044, and 1094), arms industry (SIC 3482, 2483, 2484, and 2489), aircraft industry (SIC 3721), and defense industry (SIC 3761, 3764, 3769, and 3795).

Next, we consider the extraction of oil and gas separately from other oil related activities because the extraction of oil and gas is an industry of particular strategic importance. Oil and Gas Extraction is a dummy variable that indicates whether or not the firm engages in the extraction of oil and gas, while Oil Related is a dummy variable that indicates whether or not the firm engages in the production of oil and gas related activities other than extraction.²⁵ The results are presented in Columns (3) and (4). We indeed find that the foreign bias is particularly pronounced for investments in firms that engage in the extraction of oil and gas. In fact, SWFs appear to underweight investments in oil related industries.

Next, we assess whether we find similar results for the extraction of commodities other than oil and gas. In Column (5), we include a dummy variable denoted Commodities Industry that indicates whether or not the firm engages in the mining and extraction of commodities other than oil.²⁶ We find no foreign bias for investments in firms that extract commodities other than oil and gas.

For two funds in our sample, the National Pensions Reserve Fund of Ireland and the Government Pension Fund of Norway we have comprehensive, time-series data on their equity holdings for the period 2002 to 2007, extracted from the funds' annual investment reports over this period. We repeat the analysis in Tables 5 and 6 for these two funds, exploiting the time-series dimension over the period 2002 to 2007. We have a total of 17,075 firm-year observations between these two funds. The results are presented in Table 7. In these regressions with time-series data, we also control for proxies of economic and financial development using time-varying variables that have previously been found to explain international patterns in portfolio

²⁵ Oil and Gas Extraction includes SIC 1311 and 1321 and Oil Related includes SIC 1381, 1382, and 1389.

²⁶ Specifically, we include the following industries: Metal mining (SIC 10), Coal mining (SIC 12), and Mining of nonmetallic minerals, except oil and gas (SIC 14).

allocation (see, e.g., Portes and Rey, 2005 and Chan et al., 2005). As proxy for the level of stock market development we include the ratio of stock market capitalization to GDP and as proxy for economic development in the host country we use the logarithm of per capita GDP in a given year. We obtain annual data on stock market capitalization and per capita GDP from the World Bank's World Development Indicators database. We include home and host country fixed effects and industry fixed effects to control for unobserved time-invariant country and industry characteristics. The regressions also include time-fixed effects to control for systematic differences in the foreign bias of SWFs over time. Standards errors are corrected for two-way clustering at the home and host country level.

Column (1) reports results when we measure the foreign bias of the Ireland and Norway SWFs relative to the market capitalization of each investment. We confirm our earlier findings on Religious Closeness. We also find that SWFs invest more in countries with higher per capita income.

In Columns (2) to (4), we include the oil industry-specific dummy variables, and confirm our earlier findings that the foreign bias is particularly pronounced for investments in firms that engage in the extraction of oil and gas.

In Column (5), we compare the foreign bias of SWFs to that of CalPERS. We again confirm our earlier findings that Religious Closeness is a systematically more important factor in influencing the foreign bias of SWFs than that of other global investors, such as CalPERS. For example, the results in Column (5) of Table 7 indicate that a one standard deviation increase in Religious Closeness implies an increase in foreign bias of SWFs relative to that of CalPERS of 0.26. This is significant compared to its sample standard deviation of 1.26. We find the opposite result for the legal closeness variable, though this effect is significant only at the 10 percent

level. For the other affinity variables we do not find a systematic difference between the foreign bias of SWFs and CalPERS.

For robustness, we repeat the analysis in Tables 5 to 7 after recasting the host country institutional variables (stock market development and per capita income) into bilateral differences between home and host countries following the same procedure used in constructing the closeness variables. This does not alter our main findings. We also tried including alternative time-varying measures of institutions, including measures of judicial efficiency, country risk, and accounting standards from La Porta et al. (1998) and the International Risk Country Guide but again this does not qualitatively alter our main findings.

Overall, the results indicate that the foreign investment allocation of SWFs tends to be influenced by affinity and cultural factors, particularly similarity in religion, and that this bias is stronger for SWFs than for other global investors, such as mutual funds and pension funds. This suggests that SWFs have strong preference for investing in the familiar.

Finally, we assess whether these cultural biases disappear with repeated investments in the same country. If SWFs have past investment experience in the host country, they may have fewer information asymmetries or greater familiarity in relation to additional investments since they have already acquainted with the local culture. To this end, we include a variable, denoted $\log(\text{Max Age of Inv})$, that is the logarithm of the maximum number of years that the fund has been investing in the country on a continuous basis, counting from the year in which the investment is observed. In other words, for the cross-section of investments in year t , if the fund has been investing in the country since t_0 , then this variable takes on the value of $\ln(t - t_0)$. We also include the interaction of this variable with the Religious Closeness variable. The results are presented in Column (6). We drop year 2002 observations, the first year of the sample, because

we do not know whether these investments were made during the year 2002 or before. Without the year 2002 observations, our sample reduces to 11,328 observations. We indeed find that the cultural bias is less pronounced when the fund has been an investor in the country for a longer period of time. This suggests that informational asymmetries disappear over time as investors become more acquainted with local culture. However, the coefficient estimates indicate that the cultural bias is quite persistent and disappears only slowly over time. This result is consistent with recent theoretical work by Van Nieuwerburgh and Veldkamp (2009) who argue that informational asymmetries can be persistent as long as it does not pay off for investors to acquire local information.

5. Conclusions

We collect extensive new data on investments by SWFs to study the investment behavior of SWFs. Several insights emerge from our analysis. First, we find that SWF investments exhibit cultural biases, suggesting they invest in the familiar. This raises questions about whether such investments are at odds with the principles of portfolio theory. While such preference for investing in the familiar may indicate the exploitation of informational advantages, such preference may also simply indicate affinity with the familiar, in which case it is much harder to argue that the investments are consistent with expected utility-based portfolio theory. Moreover, while such display of familiarity in international portfolio allocation is quite common among other institutional investors (e.g., Huberman 2001), we find that compared to other global investors the cultural bias of SWF investment is particularly pronounced. In addition, we find that SWFs display significant industry biases and tend to invest more in large-cap stocks, consistent with prior evidence on investments by institutional investors (e.g., Kang and Stulz,

1997, and Coval and Moskowitz, 1999). These results are consistent with the notion that cultural traits affect government decisions about the allocation of capital, including investment by government-owned institutions such as SWFs, and that such culture-induced variation in preferences may serve political rather than social objectives. While we find that this cultural bias is less pronounced when the fund has made repeated investments in the country, we find that the cultural bias is quite persistent and disappears only slowly over time.

Given their growing importance as global equity investors, SWFs could potentially play an important role as large shareholders in monitoring firms, but given their lack of transparency and potentially conflicting objectives they are unlikely to achieve such a role at this stage. Therefore, we concur with the view that SWFs should become more transparent about their investment holdings and strategies.

References

- Acemoglu, D., A. Demirguc-Kunt, and L. Laeven, 2008. "Democracy and Institutions." Mimeo, MIT.
- Alesina, A., A. Devleeschauwer, W. Easterly, S. Kurlat, and R. Wacziarg, 2003. Fractionalization. *Journal of Economic Growth* 8, 155–194.
- Baxter, M., and U. Jermann, 1997, "The International Diversification Puzzle Is Worse Than You Think," *American Economic Review* 87, 170–180.
- Bernstein, S., J. Lerner, and A. Schoar, 2009, "The Investment Strategies of Sovereign Wealth Funds," mimeo, Harvard Business School.
- Black, F., 1974, "International Capital Market Equilibrium with Investment Barriers," *Journal of Financial Economics* 1, 337–352.
- Bortolotti, B., V. Fotak, W. Megginson, and W. Miracky, 2008, "Sovereign Wealth Fund Investment Patterns and Performance", mimeo, Turin University.
- Carleton, W., J. Nelson, and M. Weisbach, 1998, "The Influence of Institutions on Corporate Governance through Private Negotiations: Evidence from TIAA-CREF," *Journal of Finance* 53, 1335–1362.
- Chan, K., V. Covrig, and L. Ng, 2005, "What Determines the Domestic Bias and Foreign Bias? Evidence from Mutual Fund Equity Allocations Worldwide," *Journal of Finance* 60, 1495–1534.
- Chen, X., J. Harford, and K. Li, 2007, "Monitoring: Which Institutions Matter?," *Journal of Financial Economics* 86, 279–305.
- Chhaochharia, V. and Y. Grinstein, 2007, "Corporate Governance and Firm Value: The Impact of the 2002 Governance Rules," *Journal of Finance* 62, 1789–1825.
- Coval, J., and T. Moskowitz, 1999, "Home Bias at Home: Local Equity Preference in Domestic Portfolios," *Journal of Finance* 54, 2045–2073.
- Coval, J., and T. Moskowitz, 2001, "The Geography of Investment: Informed Trading and Asset Prices," *Journal of Political Economy* 109, 811–841.
- Cooper, I. and E. Kaplanis, 1986, "Costs to Cross Border Investment and International Equity Market Equilibrium," In: J. Edwards, J. Franks, C. Mayer, and S. Schaefer (Eds.). *Recent Developments in Corporate Finance* (Cambridge University Press, Cambridge).

- Dahlquist, M. and G. Robertsson, 2001, “Direct Foreign Ownership, Institutional Investors, and Firm Characteristics,” *Journal of Financial Economics* 59, 413–440.
- Del Guercio, D. and J. Hawkins, 1999, “The Motivation and Impact of Pension Fund Activism,” *Journal of Financial Economics* 52, 293–340.
- Dewenter, K., X. Han, and P. Malatesta, 2009, “Firm Values and Sovereign Wealth Fund Investments,” mimeo, University of Washington.
- Doidge, C., A. Karolyi, and R. Stulz, 2008, “Has New York Become Less Competitive in Global Markets? Evaluating Foreign Listing Choices over Time,” *Journal of Financial Economics*, forthcoming.
- Edison, H. and F. Warnock, 2004, “U.S. Investor’s Emerging Market Equity Portfolios: A Security Level Analysis,” *Review of Economics and Statistics* 86, 691–704.
- Errunza, V., K. Hogan, and M. Hung, 1999, “Can the Gains from International Diversification Be Achieved Without Trading Abroad?” *Journal of Finance* 54, 2075–2107.
- Falkenstein, E., 1996, “Preferences for Stock Characteristics as Revealed by Mutual Fund Portfolio Holdings,” *Journal of Finance* 51, 111–135.
- Fernandes, N., 2009, “Sovereign Wealth Funds: Investment Choices and Implications Around the World”, mimeo, IMD.
- Ferreira, M. and P. Matos, 2008, “The Colors of Investors’ Money: The Role of Institutional Investors Around the World,” *Journal of Financial Economics* 88, 499–533.
- French, K., and J. Poterba, 1991, “Investor Diversification and International Equity Markets,” *American Economic Review* 81, 222–226.
- Froot, K., P. O’Connell, and M. Seasholes, 2001, “The Portfolio Flows of International Investors,” *Journal of Financial Economics* 59, 151–193.
- Gelos, G. and S.-J. Wei, 2005, “Transparency and International Portfolio Holdings,” *Journal of Finance* 60, 2987–3020.
- Giannetti, M. and L. Laeven, 2008, “Pension Reform, Ownership Structure, and Corporate Governance: Evidence from a Natural Experiment,” *Review of Financial Studies*, forthcoming.
- Gieve, J., 2008, “Sovereign Wealth Funds and Global Imbalances,” Quarterly Bulletin Speeches 2008 Q2, Bank of England.

- Gilson, R. and C. Milhaupt, 2008, “Sovereign Wealth Funds and Corporate Governance: A Minimalist Response to the New Mercantilism”, mimeo, Stanford Law School.
- Gleditsch, K. and M. Ward, 2001, *Minimum Distance Database*. University of Essex.
- Grinblatt, M. and M. Keloharju, 2000, “The Investment Behavior and Performance of Various Investor Types: A Study of Finland’s Unique Data Set,” *Journal of Financial Economics* 55, 43–67.
- Grinblatt, M. and M. Keloharju, 2001, “How Distance, Language, and Culture Influence Stockholdings and Trades,” *Journal of Finance* 56, 1053–1073.
- Guiso, L., P. Sapienza, and L. Zingales, 2006, “Does Culture Affect Economic Outcomes?” *Journal of Economic Perspectives* 20, 23–48.
- Guiso, L., P. Sapienza, and L. Zingales, 2007. “Cultural Biases in Economic Exchange?,” *Quarterly Journal of Economics*, forthcoming.
- Henderson, B. J., N. Jegadeesh, and M. S. Weisbach, 2006, “World Markets for Raising New Capital,” *Journal of Financial Economics* 82, 63–101.
- Hilary, G. and K.-W. Hui, 2009, “Does Religion Matter in Corporate Decision Making in America?” *Journal of Financial Economics*, forthcoming.
- Huberman, G., 2001, “Familiarity Breeds Investment,” *Review of Financial Studies* 14, 659–680.
- Inglehart, R. and C. Welzel, 2005. *Modernization, Cultural Change and Democracy*. New York: Cambridge University Press.
- International Monetary Fund, 2001. *Annual Report on Exchange Restrictions and Exchange Arrangements*. International Monetary Fund, Washington, DC.
- International Monetary Fund, 2008. *Sovereign Wealth Funds—A Work Agenda*, International Monetary Fund, Washington, DC, February 2008.
- International Working Group of Sovereign Wealth Funds, 2008. “Sovereign Wealth Funds: Generally Accepted Principles and Practices: “Santiago Principles”, October 2008.
- Johnson, S., 2007, “The Rise of Sovereign Wealth Funds”, *Finance and Development*, Washington, DC: International Monetary Fund, September 2007.
- Kang, J.-K. and R. Stulz, 1997, “Why is There a Home Bias? An Analysis of Foreign Portfolio Ownership in Japan,” *Journal of Financial Economics* 46, 3–28.
- Karpoff, J., P. Malatesta, and R. Walkling, 1996, “Corporate Governance and Shareholder initiatives: Empirical Evidence,” *Journal of Financial Economics* 42, 365–396.

- Kotter, J. and U. Lel, 2008, "Friends or Foes? The Stock Price Impact of Sovereign Wealth Fund Investments and the Price of Keeping Secrets," International Finance Discussion Paper No. 940, Board of Governors of the Federal Reserve System.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 1998, "Law and Finance," *Journal of Political Economy* 106, 1113–1155.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 1999, "Quality of Government," *Journal of Law, Economics, and Organization* 15, 222–279.
- La Porta, R., F. Lopez-de-Silanes, and A. Shleifer, 2002, "Government Ownership of Banks," *Journal of Finance* 57, 265–301.
- Lewis, K., 1996, "What Can Explain the Apparent Lack of International Consumption Risk Sharing?" *Journal of Political Economy* 104, 267–297.
- Meggison, W., R. Nash, and M. Van Randenborgh, 1994, "The Financial and Operating Performance of Newly-Privatized Firms: An International Empirical Analysis," *Journal of Finance* 49, 403–452.
- Obstfeld, M., 1994, "Risk-Taking, Global Diversification, and Growth," *American Economic Review* 84, 1310–1329.
- OECD, 2008, "Sovereign Wealth Funds and Recipient Country Policies," *OECD Investment Committee Report*, April 20, 2008.
- Portes, R. and H. Rey, 2005, "The Determinants of Cross Border Equity Flows," *Journal of International Economics* 65, 269–296.
- Rowland, P., and L. Tesar, 2004, "Multinationals and the Gains from International Diversification," *Review of Economic Dynamics* 7, 789–826.
- Sapienza, P., 2004, "The Effects of Government Ownership on Bank Lending," *Journal of Financial Economics* 72, 357–384.
- Smith, M., 1996, "Shareholder Activism by Institutional Investors: Evidence from CalPERS," *Journal of Finance* 51, 227–252.
- Stulz, R., 1981, "On the Effects of Barriers to International Investment," *Journal of Finance* 36, 923–934.
- Stulz, R. and R. Williamson, 2003, "Culture, Openness, and Finance," *Journal of Financial Economics* 70, 313–349.
- Summers, L., "Sovereign Funds Shake the Logic of Capitalism," *Financial Times*, July 30, 2007.

- Truman, E., 2007, "Sovereign Wealth Funds: The Need for Greater Transparency and Accountability," Policy Brief No. PB07-6, Peterson Institute for International Economics.
- Truman, E., 2008, "A Scoreboard for Sovereign Wealth Funds," mimeo, Washington, DC: Peterson Institute for International Economics.
- Van Nieuwerburgh, S. and L. Veldkamp, 2009, "Information Immobility and the Home Bias Puzzle," *Journal of Finance*, forthcoming.
- Weber, M., 1958, *The Protestant Ethic and the Spirit of Capitalism*, New York: Charles Scribner's Sons.
- Zingales, L., 2006. "Is the U.S. Capital Market Losing Its Competitive Edge?," *Journal of Economic Perspectives*, forthcoming.

Table 1
Description of Sovereign Wealth Funds

This table reports summary statistics for the largest (in terms of assets under management) 20 SWFs around the world. We only include funds that are members of and labeled as SWFs by the International Working Group of Sovereign Wealth Funds. Country denotes the home country of the SWF. Fund name denotes the full name of the SWF. Assets denotes an estimate of the total assets under management of the SWF at end-2007, including non-equity investments, in billions of US dollars. Inception denotes the year of inception of the SWF. Origin denotes the origin of revenues for the SWF. SWF assets to foreign reserves denotes the ratio of SWF assets under management to total foreign reserves of the home country. The data is collected from the SWF Institute and annual investment reports of individual SWFs. Data on foreign reserves are from the IMF IFS, as of end 2007, and exclude gold. For Abu Dhabi, combined reserves of United Arab Emirates are used. For Russia, asset data refers to 2008. For SWFs with complete data on equity investments, denoted with an asterisk, we report the number of foreign equity investments at year-end 2007. The coverage of equity investments is complete for the SWFs of Ireland, New Zealand, Norway, and US. Only SWFs denoted with an asterisk are included in our sample.

| Country | Fund Name | Assets (\$bn) | Inception | Origin | SWF assets to foreign reserves | Number of investments (of which foreign) |
|-------------------|------------------------------------------------|---------------|-----------|---------------|--------------------------------|------------------------------------------|
| Abu Dhabi (UAE) | Abu Dhabi Investment Authority | 875 | 1976 | Oil | 11.3 | |
| Singapore | Government of Singapore Investment Corporation | 330 | 1981 | Non-Commodity | 2.0 | |
| Norway (*) | Government Pension Fund – Global | 301 | 1990 | Oil | 4.9 | 5913 |
| Kuwait | Kuwait Investment Authority | 265 | 1953 | Oil | 15.9 | |
| Russia | National Wealth Fund | 225 | 2008 | Oil | 0.48 | |
| China | China Investment Corporation | 200 | 2007 | Non-Commodity | 13.1 | |
| Singapore | Temasek Holdings | 134 | 1974 | Non-Commodity | 0.82 | |
| Qatar | Qatar Investment Authority | 60 | 2000 | Oil | 6.4 | |
| Libya | Libyan Investment Authority | 50 | 2006 | Oil | 0.63 | |
| Australia | Australian Future Fund | 44 | 2004 | Non-Commodity | 1.8 | |
| Korea | Korea Investment Corporation | 30 | 2005 | Non-Commodity | 0.11 | |
| United States (*) | Alaska Permanent Fund | 29 | 1976 | Oil | 0.49 | 4005 |
| Ireland (*) | National Pension Reserve Fund | 23 | 2001 | Non-Commodity | 29.3 | 2050 |
| Chile | Economic and Social Stabilization Fund | 21 | 1985 | Copper | 1.2 | |
| Canada | Alberta Heritage Savings Trust Fund | 15 | 1976 | Oil | 0.37 | |
| Bahrain | Reserve Fund for Strategic Projects | 14 | 2006 | Oil | n.a. | |
| Iran | Oil Stabilization Fund | 13 | 1999 | Oil | n.a. | |
| Azerbaijan | State Oil Fund | 10 | 1999 | Oil | 2.4 | |
| New Zealand (*) | New Zealand Superannuation Fund | 9 | 2003 | Non-Commodity | 0.52 | 2876 |
| Botswana | Pula Fund | 7 | 1966 | Diamonds | 0.72 | |

Table 2
Geographical Distribution of Equity Investments of Sovereign Wealth Funds

This table reports the geographical distribution of equity investments of SWFs in our sample at end-2007. Data is collected from the annual investment reports of individual SWFs. The last column reports the share of each country's stock market capitalization in world stock market capitalization. Market capitalization of equity investments is collected from Datastream and Compustat. We only list countries that represent at least 0.01% of the individual SWF's portfolio.

| Country | Alaska Permanent Fund | Govt Pension Fund of Norway | National Pension Reserve Fund of Ireland | New Zealand Superannuation Fund | Global allocation |
|----------------------|-----------------------|-----------------------------|------------------------------------------|---------------------------------|-------------------|
| Argentina | <0.01% | <0.01% | <0.01% | 0.04% | 0.14% |
| Australia | 1.10% | 1.53% | 0.95% | 7.43% | 1.77% |
| Austria | 0.27% | 0.37% | 0.82% | 1.10% | 0.31% |
| Belgium | 0.21% | 0.76% | 1.70% | 0.43% | 0.64% |
| Bermuda | 1.01% | 0.12% | <0.01% | 0.01% | <0.01% |
| Brazil | 0.60% | 0.66% | <0.01% | 1.16% | 2.21% |
| Canada | 1.47% | 2.03% | 1.40% | 2.84% | 2.74% |
| Chile | 0.03% | <0.01% | <0.01% | 0.05% | 0.34% |
| China | 0.28% | 0.59% | <0.01% | 0.94% | 10.04% |
| Colombia | 0.05% | <0.01% | <0.01% | 0.02% | 0.16% |
| Czech Republic | 0.16% | 0.09% | <0.01% | 0.04% | 0.12% |
| Denmark | 0.21% | 0.43% | 0.37% | 1.18% | 0.37% |
| Egypt | 0.11% | 0.02% | <0.01% | 0.04% | 0.22% |
| Finland | 0.40% | 0.78% | 2.40% | 0.47% | 0.43% |
| France | 3.61% | 7.47% | 15.73% | 3.41% | 3.92% |
| Germany | 2.18% | 9.93% | 13.97% | 2.60% | 2.64% |
| Greece | 0.19% | 0.48% | 1.19% | 0.13% | 0.34% |
| Hong Kong | 0.70% | 1.14% | 0.56% | 1.17% | 2.77% |
| Hungary | 0.11% | <0.01% | <0.01% | 0.06% | 0.08% |
| India | 0.27% | 0.12% | <0.01% | 0.42% | 2.93% |
| Indonesia | 0.03% | 0.03% | <0.01% | 0.19% | 0.34% |
| Ireland | 0.21% | 0.27% | <0.01% | 0.12% | 0.26% |
| Israel | 0.43% | 0.04% | <0.01% | 0.15% | 0.38% |
| Italy | 0.52% | 2.57% | 5.99% | 1.68% | 1.66% |
| Japan | 5.50% | 7.90% | 3.23% | 7.18% | 7.62% |
| Korea | 0.44% | 1.46% | <0.01% | 0.87% | 1.81% |
| Luxembourg | 0.22% | 0.10% | 0.83% | <0.01% | 0.13% |
| Malaysia | 0.06% | 0.05% | <0.01% | 0.11% | 0.53% |
| Mexico | 0.47% | 0.38% | <0.01% | 8.80% | 0.64% |
| New Zealand | 0.01% | 0.05% | <0.01% | <0.01% | 0.07% |
| Netherlands | 1.65% | 2.60% | 4.97% | <0.01% | 1.26% |
| Norway | 0.29% | <0.01% | 0.54% | 0.46% | 0.45% |
| Oman | 0.02% | <0.01% | <0.01% | <0.01% | 0.04% |
| Panama | 0.13% | <0.01% | <0.01% | <0.01% | 0.01% |
| Pakistan | <0.01% | <0.01% | <0.01% | 0.03% | 0.11% |
| Philippines | 0.05% | 0.01% | <0.01% | 0.01% | 0.17% |
| Poland | 0.17% | <0.01% | <0.01% | 0.09% | 0.33% |
| Portugal | 0.05% | 0.20% | 0.60% | 0.48% | 0.17% |
| Puerto Rico | 0.03% | <0.01% | <0.01% | 0.01% | <0.01% |
| Russia | 0.46% | 0.05% | <0.01% | 0.85% | 2.42% |
| Singapore | 0.31% | 0.54% | <0.01% | 0.71% | 0.45% |
| Sweden | 0.37% | 1.86% | 0.66% | 0.75% | 0.92% |
| Switzerland | 2.90% | 4.89% | 2.26% | 4.84% | 1.96% |
| South Africa | 0.28% | 0.58% | <0.01% | 0.42% | 1.34% |
| Spain | 0.52% | 2.32% | 6.65% | 1.78% | 2.13% |
| Taiwan | 0.58% | 0.45% | <0.01% | 0.79% | 1.17% |
| Thailand | 0.08% | 0.04% | <0.01% | 0.19% | 0.32% |
| Turkey | 0.17% | 0.08% | <0.01% | 0.11% | 0.46% |
| United Arab Emirates | <0.01% | <0.01% | <0.01% | <0.01% | 0.36% |
| United Kingdom | 5.45% | 19.18% | 5.59% | 7.58% | 6.12% |
| United States | 64.31% | 27.76% | 28.73% | 38.24% | 31.34% |

Table 3
Industrial Distribution of Equity Investments of Sovereign Wealth Funds

This table reports the industrial distribution of equity investments of SWFs in our sample. The data is collected from the annual investment reports of individual SWFs. Market capitalization of equity investments is collected from Datastream and Compustat. We use the market capitalization as of end 2007.

| Country | Alaska Permanent Fund | Government Pension Fund of Norway | National Pension Reserve Fund of Ireland | New Zealand Superannuation Fund |
|-------------------|--------------------------|-----------------------------------------|------------------------------------------------|---------------------------------------|
| Basic materials | 7.12% | 3.60% | 8.48% | 7.32% |
| Consumer goods | 4.94% | 8.10% | 7.42% | 4.19% |
| Consumer services | 7.93% | 12.80% | 6.94% | 5.64% |
| Financials | 19.25% | 25.50% | 24.51% | 27.11% |
| Healthcare | 10.14% | 6.60% | 6.14% | 5.45% |
| Industrials | 9.05% | 9.70% | 11.34% | 18.69% |
| Oil and gas | 7.86% | 6.70% | 9.01% | 8.71% |
| Technology | 15.34% | 6.80% | 9.00% | 7.79% |
| Telecommunication | 6.29% | 3.80% | 6.63% | 6.23% |
| Utilities | 3.27% | 0.00% | 7.36% | 5.01% |
| Unlisted equities | 8.81% | 0.30% | 3.17% | 3.84% |

Table 4
Determinants of Foreign Bias of Sovereign Wealth Funds: Country-Level Data

This table presents bilateral country-level regressions results of the foreign bias of SWFs as compared to each country's weight in a benchmark portfolio. The benchmark portfolio constitutes the world market capitalization, the MSCI index, the equity allocation of CPIS investors, the equity allocation of US mutual funds, and the equity allocation of CalPERS, respectively. In Columns (1) and (6), the dependent variable is foreign bias, defined as the log difference between the share of country *j* in fund holdings of country *i* and the share to the world market capitalization weight of country *j* at year-end 2007. In Column (2), foreign bias is measured with respect to the weight in the MSCI world index at year-end 2007. In Column (3), the dependent variable is the log ratio of the share of country *j* in the equity portfolio of SWF from country *i* to the share of country *j* in aggregate CPIS equity holdings at year-end 2007. In Column (4), the dependent variable is the log ratio of the share of country *j* in the equity portfolio of SWF from country *i* to the share of country *j* in aggregate US-domiciled global mutual fund equity holdings at year-end 2007. In Column (5), the dependent variable is the log ratio of the share of country *j* in the equity portfolio of SWF from country *i* to the share of country *j* in equity holdings of the CalPERS fund at year-end 2007. Physical closeness is the inverse geographical distance (in kilometers) between the capitals of the source and host country of the SWF investment. It is inverse of distance measured in kilometers. Language closeness and religious closeness are cultural proximity variables that indicate similarity in culture between the host and host country. The variables are defined as the uncentered correlation between country pairs. Legal Closeness is a dummy variable that indicates whether or not the home and host country of investment share common legal tradition. All regressions correct for clustering at the home country level and the regression in Column (6) also includes host country fixed effects. ***, ** and * represent significance at the 1%, 5% and 10% respectively.

| | Mktcap | | MSCI | | CPIS | | Mutual Fund | | CalPERS | | Mktcap | |
|-------------------------------------|-------------------|-----|-------------------|----|-------------------|----|-------------------|-----|------------------|----|-------------------|-----|
| | (1) | | (2) | | (3) | | (4) | | (5) | | (6) | |
| Physical Closeness | 0.503 (0.334) | | 0.251 (0.260) | | 0.143 (0.289) | | 0.361 (0.226) | | 0.306 (0.265) | | -0.022 (0.399) | |
| Language Closeness | -0.313 (0.906) | | -0.277 (0.581) | | 0.081 (1.084) | | 0.366 (0.799) | | 0.260 (0.668) | | -0.321 (0.796) | |
| Religious Closeness | 2.035 (0.187) | *** | 0.816 (0.247) | ** | 1.332 (0.398) | ** | 1.177 (0.227) | *** | 0.791 (0.308) | ** | 1.196 (0.327) | *** |
| Legal Closeness | -0.279 (0.866) | | -0.288 (0.755) | | -0.319 (1.011) | | -0.551 (0.817) | | 0.867 (0.834) | | 0.394 (0.862) | |
| Clustered std errors (home country) | Y | | Y | | Y | | Y | | Y | | Y | |
| Host Country Fixed Effects | N | | N | | N | | N | | N | | Y | |
| N | 150 | | 139 | | 139 | | 131 | | 136 | | 150 | |
| R ² | 0.25 | | 0.11 | | 0.11 | | 0.16 | | 0.12 | | 0.78 | |

Table 5
Determinants of Foreign Bias of Sovereign Wealth Funds: Firm-Level Data

This table presents firm-level regressions results of the foreign bias of SWFs as compared to each firm's weight in a benchmark portfolio. The benchmark portfolio constitutes the world market capitalization or the equity allocation of CalPERS. The dependent variable is foreign bias, defined as the difference between the share of firm *j* in total equity investment of the fund and the share of firm *j* in the world market capitalization as of 2007. In column (2), the dependent variable is foreign bias with respect to CalPERS, defined as the difference between the share of firm *j* in total equity investment of the fund and the share of firm *j* in total equity investment of CalPERS as of 2007. Foreign bias is reported in tenths of a percentage (per mille). Physical closeness is the inverse geographical distance (in kilometers) between the capitals of the source and host country of the SWF investment. It is inverse of distance measured in kilometers. Language closeness and religious closeness are cultural proximity variables that indicate similarity in culture between the host and host country in 1980. The variables are defined as the uncentered correlation between country pairs. Legal Closeness is a dummy variable that indicates whether or not the home and host country of investment share common legal tradition. Hofstede Value Closeness is the uncentered correlation between the value indexes constructed by Hofstede. World Survey Closeness is the uncentered correlation between the world survey variables. Colonial Heritage Closeness is a dummy variable that indicates whether or not the home and host country of investment share common colonial heritage. Telephone Traffic is the total volume of telephone calls (in millions of minutes) between the home and host country of investment divided by the square root of the product of GDP (in billions of US dollars) of the two countries. Language Closeness 2001 and Religious Closeness 2001 are cultural proximity variables that indicate similarity in culture between the host and host country in 2001. The variables are defined as the uncentered correlation between country pairs. Log(mktcap) is the logarithm of the firm's market capitalization. Leverage is the ratio of total liabilities to total assets. Current ratio is the ratio of cash and short-term investments to total assets. ROA is the ratio of pre-tax profits to total assets. Market to book is the ratio of market value to book value of equity. All regression include home country, host country, and industry fixed effects, with standard errors corrected for two-way clustering at the home and host country level. ***, ** and * represent significance at the 1%, 5% and 10% respectively.

| | Mktcap | CalPERS | Mktcap | Mktcap | Mktcap | Mktcap | Mktcap |
|-----------------------------|-----------|----------|-----------|------------|----------|----------|-----------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Physical Closeness | 0.153 * | 0.224 ** | 0.153 * | 0.174 ** | 0.123 | 0.223 | 0.080 |
| | (0.091) | (0.092) | (0.085) | (0.083) | (0.085) | (0.294) | (0.064) |
| Language Closeness | -0.249 | 0.155 | -0.249 | 0.075 | -7.205 * | -0.236 | |
| | (0.307) | (0.652) | (0.304) | (0.280) | (4.280) | (0.312) | |
| Religious Closeness | 0.452 *** | 0.600 ** | 0.452 *** | 0.503 *** | 0.390 ** | 0.423 ** | |
| | (0.146) | (0.258) | (0.145) | (0.149) | (0.155) | (0.147) | |
| Legal Closeness | -0.217 | -0.356 | -0.219 | -0.243 | -0.205 | -0.243 | -0.388 ** |
| | (0.176) | (0.384) | (0.224) | (0.169) | (0.173) | (0.215) | (0.160) |
| Hofstede Value Closeness | | | 0.023 | | | | |
| | | | (2.112) | | | | |
| World Survey Closeness | | | | -0.329 *** | | | |
| | | | | (0.115) | | | |
| Colonial Heritage Closeness | | | | | 6.870 | | |
| | | | | | (4.252) | | |
| Telephone Traffic | | | | | | -0.042 | |
| | | | | | | (0.132) | |
| Language Closeness 2001 | | | | | | | -0.411 |
| | | | | | | | (0.221) |
| Religious Closeness 2001 | | | | | | | 0.614 *** |
| | | | | | | | (0.152) |
| Log(mktcap) | 0.174 ** | 0.048 | 0.175 ** | 0.177 ** | 0.176 ** | 0.174 ** | 0.181 |
| | (0.087) | (0.074) | (0.087) | (0.087) | (0.087) | (0.087) | (0.088) |
| Leverage | 0.128 | 0.114 | 0.128 | 0.131 | 0.129 | 0.129 | 0.134 |
| | (0.192) | (0.125) | (0.192) | (0.191) | (0.191) | (0.191) | (0.195) |
| Current Ratio | 0.004 | 0.006 * | 0.004 | 0.004 | 0.005 | 0.004 | 0.005 |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.004) |
| ROA | -0.189 | -0.175 | -0.189 | -0.184 | -0.198 | -0.189 | -0.186 |

| | | | | | | | |
|----------------------------------------------|--------------------------------|-----------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Market to Book | (0.198) -0.116 * (0.006) | (0.184) 0.008 (0.014) | (0.201) -0.012 * (0.007) | (0.204) -0.011 * (0.006) | (0.198) -0.012 * (0.007) | (0.196) -0.012 * (0.007) | (0.200) -0.011 (0.007) |
| Home country fixed effects | Y | Y | Y | Y | Y | Y | Y |
| Host country fixed effects | Y | Y | Y | Y | Y | Y | Y |
| Industry fixed effects | Y | Y | Y | Y | Y | Y | Y |
| Clustered std errors (home and host country) | Y | Y | Y | Y | Y | Y | Y |
| N | 5564 | 3045 | 5564 | 5564 | 5564 | 5564 | 5564 |
| R ² | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |

Table 6
Determinants of Foreign Bias of Sovereign Wealth Funds: Industry Effects

This table presents equity investment-level regressions results of the foreign bias of SWFs as compared to each investment's weight in a benchmark portfolio. The dependent variable is foreign bias, defined as the difference between the share of firm *j* in total equity investment of the fund and the share of firm *j* in the world market capitalization as of 2007. Foreign bias is reported in tenths of a percentage (per mille). Physical closeness is the inverse geographical distance (in kilometers) between the capitals of the source and host country of the SWF investment. It is inverse of distance measured in kilometers. Language closeness and religious closeness are cultural proximity variables that indicate similarity in culture between the host and host country in 1980. The variables are defined as the uncentered correlation between country pairs. Legal Closeness is a dummy variable that indicates whether or not the home and host country of investment share common legal tradition. Log(mktcap) is the logarithm of the firm's market capitalization. Leverage is the ratio of total liabilities to total assets. Current ratio is the ratio of cash and short-term investments to total assets. ROA is the ratio of pre-tax profits to total assets. Market to book is the ratio of market value to book value of equity. Unethical Industry is a dummy variable that indicates whether or not the firm engages in mining activities that are potentially harmful to the environment or in the production of arms and ammunition. Oil Industry is a dummy variable that indicates whether or not the firm engages in the production or extraction of oil and gas or related activities. Oil and Gas Extraction is a dummy variable that indicates whether or not the firm engages in the extraction of oil and gas. Oil Related is a dummy variable that indicates whether or not the firm engages in the production of oil and gas related activities other than extraction. Commodities Industry is a dummy variable that indicates whether or not the firm engages in the production or extraction of commodities and related activities. All regression include home country, host country, and industry fixed effects, with standard errors corrected for two-way clustering at the home and host country level. ***, ** and * represent significance at the 1%, 5% and 10% respectively.

| | Mktpcap | Mktpcap | Mktpcap | Mktpcap | Mktpcap |
|----------------------------|-----------|-----------|-----------|-----------|-----------|
| | (1) | (2) | (3) | (4) | (5) |
| Physical Closeness | 0.154 * | 0.156 * | 0.160 * | 0.154 * | 0.153 |
| | (0.091) | (0.092) | (0.087) | (0.089) | (0.091) |
| Language Closeness | -0.249 | -0.252 | -0.243 | -0.245 | -0.249 |
| | (0.307) | (0.305) | (0.304) | (0.307) | (0.307) |
| Religious Closeness | 0.450 *** | 0.448 *** | 0.433 *** | 0.445 *** | 0.452 *** |
| | (0.146) | (0.146) | (0.143) | (0.145) | (0.147) |
| Legal Closeness | -0.221 | -0.219 | -0.232 | -0.222 | -0.218 |
| | (0.177) | (0.176) | (0.179) | (0.177) | (0.176) |
| Log(mktpcap) | 0.175 ** | 0.177 ** | 0.162 * | 0.167 ** | 0.175 ** |
| | (0.088) | (0.086) | (0.086) | (0.085) | (0.087) |
| Leverage | 0.125 | 0.12 | 0.155 | 0.147 | 0.128 |
| | (0.191) | (0.192) | (0.190) | (0.194) | (0.194) |
| Current Ratio | 0.004 | 0.003 | 0.003 | 0.004 | 0.004 |
| | (0.000) | (0.003) | (0.003) | (0.003) | (0.004) |
| ROA | -0.020 | -0.209 | -0.202 | -0.178 | -0.186 |
| | (0.019) | (0.197) | (0.175) | (0.187) | (0.202) |
| Market to Book | -0.001 * | -0.012 * | -0.008 * | -0.010 * | -0.011 * |
| | (0.001) | (0.006) | (0.007) | (0.006) | (0.007) |
| Unethical Industry | -0.016 * | | | | |
| | (0.008) | | | | |
| Oil Industry | | 0.973 *** | | | |
| | | (0.139) | | | |
| Oil and Gas Extraction | | | 1.740 ** | | |
| | | | (0.838) | | |
| Oil Related | | | | -0.760 * | |
| | | | | (0.405) | |
| Commodities Industry | | | | | -0.045 |
| | | | | | (0.071) |
| Home country fixed effects | Y | Y | Y | Y | Y |

| | | | | | |
|----------------------------------------------|------|------|------|------|------|
| Host country fixed effects | Y | Y | Y | Y | Y |
| Industry fixed effects | Y | Y | Y | Y | Y |
| Clustered std errors (home and host country) | Y | Y | Y | Y | Y |
| N | 5564 | 5564 | 5564 | 5564 | 5564 |
| R ² | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |

Table 7
Determinants of Foreign Bias of Sovereign Wealth Funds: Time Series

This table presents equity investment-level regressions results of the foreign bias of SWFs as compared to each investment's weight in a benchmark portfolio in a given year over the period 2002 to 2007. The dependent variable is foreign bias, defined as the difference between the share of firm *j* in total equity investment of the fund and the share of firm *j* in the world market capitalization. Foreign bias is reported in tenths of a percentage (per mille). Physical closeness is the inverse geographical distance (in kilometers) between the capitals of the source and host country of the SWF investment. It is inverse of distance measured in kilometers. Language closeness and religious closeness are cultural proximity variables that indicate similarity in culture between the host and host country in 1980. The variables are defined as the uncentered correlation between country pairs. Legal Closeness is a dummy variable that indicates whether or not the home and host country of investment share common legal tradition. Log(mktcap) is the logarithm of the firm's market capitalization. Leverage is the ratio of total liabilities to total assets. Current ratio is the ratio of cash and short-term investments to total assets. ROA is the ratio of pre-tax profits to total assets. Market to book is the ratio of market value to book value of equity. Unethical Industry is a dummy variable that indicates whether or not the firm engages in mining activities that are potentially harmful to the environment or in the production of arms and ammunition. Oil Industry is a dummy variable that indicates whether or not the firm engages in the production or extraction of oil and gas or related activities. Oil and Gas Extraction is a dummy variable that indicates whether or not the firm engages in the extraction of oil and gas. Oil Related is a dummy variable that indicates whether or not the firm engages in the production of oil and gas related activities other than extraction. Commodities Industry is a dummy variable that indicates whether or not the firm engages in the mining and extraction of commodities other than oil and gas. Stock market development is stock market capitalization as a fraction of GDP. Log Per Capita GDP is the logarithm of per capita GDP. All regression include home country, host country, industry, and year fixed effects, with standard errors corrected for two-way clustering at the home and host country level. ***, ** and * represent significance at the 1%, 5% and 10% respectively.

| | Mktcap | Mktcap | Mktcap | Mktcap | CalPERS | Repeated investments |
|------------------------------|---------------------|----------------------|----------------------|---------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Physical Closeness | 0.127 (0.213) | 0.132 (0.212) | 0.132 (0.211) | 0.125 (0.212) | 0.012 (0.113) | 0.105 (0.185) |
| Language Closeness | 0.222 (0.593) | 0.220 (0.593) | 0.259 (0.584) | 0.240 (0.590) | 0.881 (0.718) | -0.052 (0.616) |
| Religious Closeness | 0.492 ** (0.213) | 0.490 ** (0.213) | 0.496 ** (0.210) | 0.494 ** (0.212) | 0.672 *** (0.202) | 1.481 *** (0.503) |
| Legal Closeness | -0.711 (0.436) | -0.716 (0.435) | -0.751 * (0.433) | -0.722 (0.436) | -1.129 * (0.590) | -0.518 (0.410) |
| Log(mktcap) | 0.148 (0.104) | 0.152 (0.103) | 0.132 (0.100) | 0.139 (0.099) | 0.073 (0.084) | 0.121 (0.106) |
| Leverage | -0.008 (0.007) | -0.021 (0.070) | 0.008 (0.065) | 0.013 (0.065) | 0.032 (0.062) | 0.009 (0.060) |
| Current Ratio | 0.008 (0.007) | 0.007 (0.006) | 0.007 (0.065) | 0.008 (0.007) | 0.014 * (0.008) | 0.006 (0.007) |
| ROA | -0.161 (0.114) | -0.185 (0.111) | -0.143 (0.097) | -0.127 (0.107) | -0.050 (0.058) | -0.129 (0.088) |
| Market to Book | -0.002 (0.004) | -0.002 (0.004) | 0.000 (0.004) | -0.001 (0.005) | 0.001 (0.003) | -0.001 (0.004) |
| Stock Market Development | 0.329 (0.364) | 0.332 (0.356) | 0.392 (0.422) | 0.353 (0.399) | 1.204 (0.104) | -0.049 (0.356) |
| Log Per Capita GDP | 1.756 ** (0.822) | 1.707 ** (0.784) | 1.121 (0.784) | 1.544 ** (0.679) | -1.611 (1.401) | 0.837 (1.200) |
| Oil Industry Dummy | | 1.095 *** (0.187) | | | | |
| Oil Gas and Extraction Dummy | | | 2.820 *** (0.657) | | | |
| Oil Related Dummy | | | | -1.174 * (0.617) | | |
| Log(Max Age of Inv) | | | | | | -0.443 *** |

| | | | | | | |
|----------------------------------------------|-------|-------|-------|-------|------|----------|
| Religious Closeness * | | | | | | (0.092) |
| Log(Max Age of Inv) | | | | | | -0.585 * |
| | | | | | | (0.335) |
| Home country fixed effects | Y | Y | Y | Y | Y | Y |
| Host country fixed effects | Y | Y | Y | Y | Y | Y |
| Industry fixed effects | Y | Y | Y | Y | Y | Y |
| Year fixed effects | Y | Y | Y | Y | Y | Y |
| Clustered std errors (home and host country) | Y | Y | Y | Y | Y | Y |
| N | 12532 | 12532 | 12532 | 12532 | 6771 | 11328 |
| R ² | 0.18 | 0.18 | 0.18 | 0.18 | 0.14 | 0.18 |

Appendix 1

Largest Sovereign Wealth Funds and Other Global Investors Compared

This table reports total assets under management for the three largest investors in the following four investor classes: asset managers, SWFs, private equity funds, and hedge funds. Data refer to year-end 2007 and are obtained from Citibank and Table 1.

| Type of investor | Rank | Name | Assets under management (US\$bn) |
|-----------------------------|------|------------------------------------------------|----------------------------------|
| <i>Asset managers</i> | 1 | Barclays Global Investors | 1,813 |
| | 2 | State Street Global Advisors | 1,749 |
| | 3 | Fidelity Investments | 1,635 |
| <i>SWFs</i> | 1 | Abu Dhabi Investment Authority | 875 |
| | 2 | Government of Singapore Investment Corporation | 330 |
| | 3 | Norway Government Pension Fund | 301 |
| <i>Private equity funds</i> | 1 | Carlyle Group | 33 |
| | 2 | Kohlberg, Kravis and Roberts (KKR) | 31 |
| | 3 | Goldman Sachs Principle Investment | 31 |
| <i>Hedge funds</i> | 1 | JP Morgan Asset Management | 33 |
| | 2 | Goldman Sachs Asset Management | 33 |
| | 3 | Bridgewater Associates | 30 |

Appendix 2

Summary Statistics of Regression Variables

This table reports summary statistics for the main regression variables. Foreign bias is defined as the difference between the share of a given firm in total equity investment of the fund and the share of that firm in the world market capitalization. Foreign bias is reported in tenths of a percentage (per mille). Physical closeness is the inverse geographical distance (in kilometers) between the capitals of the source and host country of the SWF investment. It is inverse of distance measured in kilometers. Language closeness and religious closeness are cultural proximity variables that indicate similarity in culture between the host and host country in 1980. The variables are defined as the uncentered correlation between country pairs. Legal Closeness is a dummy variable that indicates whether or not the home and host country of investment share common legal tradition. Hofstede Value Closeness is the uncentered correlation between the value indexes constructed by Hofstede. World Survey Closeness is the uncentered correlation between the world survey variables. Colonial Heritage Closeness is a dummy variable that indicates whether or not the home and host country of investment share common colonial heritage. Telephone Traffic is the total volume of telephone calls (in millions of minutes) between the home and host country of investment divided by the square root of the product of GDP (in billions of US dollars) of the two countries. Language Closeness 2001 and Religious Closeness 2001 are cultural proximity variables that indicate similarity in culture between the host and host country in 2001. The variables are defined as the uncentered correlation between country pairs. Mktcap is the firm's market capitalization (in \$ billions). Leverage is the ratio of total liabilities to total assets. Current ratio is the ratio of cash and short-term investments to total assets. ROA is the ratio of pre-tax profits to total assets. Market to book is the ratio of market value to book value of equity. Panel A reports summary statistic for all explanatory variables and Panel B reports the correlation matrix between them. ***, ** and * represent significance at the 1%, 5% and 10% respectively.

Panel A: Summary Statistics

| | Foreign Bias | Physical Closeness | Language Closeness | Religious Closeness | Legal Closeness | Hofstede Value Closeness | World Survey Closeness | Colonial Heritage Closeness | Telephone Traffic |
|---------|--------------|--------------------|--------------------|---------------------|-----------------|--------------------------|------------------------|-----------------------------|-------------------|
| Mean | 0.246 | 0.323 | 0.135 | 0.465 | 0.271 | 0.865 | 0.319 | 0.264 | 0.280 |
| Median | 0.019 | 0.119 | 0.000 | 0.539 | 0.000 | 0.886 | 0.502 | 0.000 | 0.112 |
| Min | -6.767 | 0.050 | 0.000 | 0.000 | 0.000 | 0.629 | -1.000 | 0.000 | 0.004 |
| Max | 53.789 | 2.387 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 3.826 |
| Std Dev | 1.487 | 0.442 | 0.328 | 0.381 | 0.446 | 0.099 | 0.619 | 0.443 | 0.587 |
| N | 5563 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |

| | Language Closeness 2001 | Religious Closeness 2001 | Mktcap | Leverage | Current Ratio | ROA | Market to Book |
|---------|-------------------------|--------------------------|---------|----------|---------------|--------|----------------|
| Mean | 0.258 | 0.438 | 3.960 | 0.230 | 1.970 | 0.135 | 1.628 |
| Median | 0.004 | 0.347 | 0.012 | 0.209 | 1.459 | 0.125 | 1.043 |
| Min | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -2.750 | 0.032 |
| Max | 1.000 | 1.000 | 504.000 | 5.440 | 47.668 | 1.036 | 46.366 |
| Std Dev | 0.405 | 0.422 | 18.300 | 0.212 | 2.165 | 0.128 | 2.128 |
| N | 150 | 150 | 5563 | 5563 | 5563 | 5563 | 5563 |

Panel B: Correlation Matrix

| | Physical Closeness | Language Closeness | Religious Closeness | Legal Closeness | Hofstede Value Closeness | World Survey Closeness | Colonial Heritage Closeness | Telephone Traffic | Language Closeness 2001 |
|-----------------------------|-----------------------|-----------------------|------------------------|--------------------|--------------------------------|------------------------------|-----------------------------------|----------------------|-------------------------------|
| Language Closeness | 0.00 | | | | | | | | |
| Religious Closeness | 0.24* | 0.28*** | | | | | | | |
| Legal Closeness | 0.05 | 0.53*** | 0.05 | | | | | | |
| Hofstede Value Closeness | 0.23* | 0.45*** | 0.56*** | 0.16* | | | | | |
| World Survey Closeness | 0.28** | 0.28*** | 0.39*** | 0.11 | 0.50*** | | | | |
| Colonial Heritage Closeness | -0.13 | 0.69*** | 0.08 | 0.74*** | 0.17* | 0.03 | | | |
| Telephone Traffic | 0.44*** | 0.41*** | 0.15 | 0.31*** | 0.24** | 0.18* | 0.31*** | | |
| Language Closeness 2001 | -0.001 | 0.65*** | 0.28*** | 0.31*** | 0.38*** | 0.31** | 0.44*** | 0.38*** | |
| Religious Closeness 2001 | -0.02 | 0.16* | 0.36*** | 0.07 | 0.26** | 0.14* | 0.03 | 0.08 | 0.22** |